CLAIMS

What is claimed is:

1. A network architecture comprising:

a transport layer including an optical network;

at least one node having a large packet switch to couple to the transport layer and to an access layer, the large packet switch to aggregate a plurality of services from the access layer and to perform packet level grooming; and

wherein restoration is performed by the optical network.

2. The network architecture of claim 1, wherein the optical network is an optical ring network including at least one optical switch.

3. The network architecture of claim 2, wherein restoration is performed at a layer-0 (optical layer) of the optical ring network.

4. The network architecture of claim 1, wherein the optical network is a bi-directional line-switched ring (BLSR) utilizing a Synchronous Optical Network (SONET) standard.

5. The network architecture of claim 4, wherein restoration is performed by a layer-1 (SONET layer).

6. The network architecture of claim 1, wherein the access layer includes at least one of a Time Division Multiplexed (TDM) voice service, a Internet Protocol (IP) service, or an Asynchronous Transfer Mode (ATM) service.

7. The network architecture of claim 1, wherein the access layer includes a leased line service that is provided and restored through an optical switch of the transport layer.

8. The network architecture of claim 1, further comprising selecting optimized core node locations for the placement of core nodes based upon a cost optimization of an aggregated plurality of services aggregated by the large packet switch, wherein at least one core node includes a large packet switch.

9. The network architecture of claim 8, further comprising determining an optimized converged optical network transport layer design for the aggregated plurality of services based upon routed transport demands of the aggregated plurality of services.

10. The network architecture of claim 8, further comprising determining an optimized access layer network design for the aggregated plurality of services by determining an optimal number of access devices and an optimal sizing of the access devices for each service.

11. A method for optimizing network architectures comprising:

generating a traffic model of a plurality of services to be carried through a network;

performing a cost optimization for at least one of the plurality of services;

selecting core node locations for the at least one service based upon the cost optimization of the at least one service;

generating routed transport demands based upon the traffic model;

determining at least one optimized transport layer network design for the at least one service based upon routed transport demands; and

determining an optimized access layer network design for the at least one service.

12. The method of claim 11, wherein selecting core node locations for the at least one service includes selecting core node locations for each service of the plurality of services based upon a cost optimization for each service.

13. The method of claim 11, wherein determining the at least one optimized transport layer network design includes determining an optimized transport layer

network for each service of the plurality of services based upon the routed transport demand of each service.

14. The method of claim 11, wherein determining an optimized access layer network design for at the least one service includes determining an optimal number of access devices for each service of the plurality of services and an optimal sizing of the access devices for each service.

15. The method of claim 11, wherein selecting core node locations for the at least one service includes selecting core node locations for an aggregated plurality of services based upon a cost optimization of the aggregated plurality of services.

16. The method of claim 15, wherein determining the at least one optimized transport layer network design for the at least one service includes determining an optimized converged optical network transport layer design for the aggregated plurality of services based upon routed transport demands.

17. The method of claim 15, wherein determining an optimized access layer network design for the at least one service includes determining an optimized access layer network design for the aggregated plurality of services by determining an optimal number of access devices and an optimal sizing of the access devices for each service of the aggregated plurality of services.

18. A method for designing a network architecture comprising:

provisioning an optical network as part of a transport layer;

coupling at least one node having a large packet switch to the transport layer and to an access layer;

aggregating a plurality of services from the access layer with the large packet switch;

performing packet level grooming with the large packet switch; and

performing restoration utilizing the optical network.

19. The method of claim 18, wherein the optical network is an optical ring network including at least one optical switch.

20. The method of claim 19, wherein restoration is performed at a layer-0 (optical layer) of the optical ring network.

21. The method of claim 18, wherein the optical network is a bi-directional line-witched ring (BLSR) utilizing a Synchronous Optical Network (SONET) standard.

22. The method of claim 21, wherein restoration is performed by a layer-1 (SONET layer).

23. The method of claim 18, wherein the access layer includes at least one of a Time Division Multiplexed (TDM) voice service, a Internet Protocol (IP) service, or an Asynchronous Transfer Mode (ATM) service.

24. The method of claim 18, wherein the access layer includes a leased line service that is provided and restored through an optical switch of the transport layer.

25. The method of claim 18, further comprising selecting optimized core node locations for the placement of core nodes based upon a cost optimization of an aggregated plurality of services aggregated by the large packet switch, wherein at least one core node includes a large packet switch.

26. The method of claim 25, further comprising determining an optimized converged optical network transport layer design for the aggregated plurality of services based upon routed transport demands of the aggregated plurality of services.

27. The method of claim 25, further comprising determining an optimized access layer network design for the aggregated plurality of services by determining an optimal number of access devices and an optimal sizing of the access devices for each service.

28. A machine-readable medium having stored thereon instructions, which when executed by a machine, causes the machine to perform operations comprising:

generating a traffic model of a plurality of services to be carried through a network;

performing a cost optimization for at least one of the plurality of services;

selecting core node locations for the at least one service based upon the cost optimization of the at least one service;

generating routed transport demands based upon the traffic model;

determining at least one optimized transport layer network design for the at least one service based upon routed transport demands; and

determining an optimized access layer network design for the at least one service.

29. The machine-readable medium of claim 28, wherein the operation of selecting core node locations for the at least one service includes selecting core node locations for each service of the plurality of services based upon a cost optimization for each service.

30. The machine-readable medium of claim 28, wherein the operation of determining the at least one optimized transport layer network design includes determining an optimized transport layer network for each service of the plurality of services based upon the routed transport demand of each service.

31. The machine-readable medium of claim 28, wherein the operation of determining an optimized access layer network design for at the least one service includes determining an optimal number of access devices for each service of the plurality of services and an optimal sizing of the access devices for each service.

32. The machine-readable medium of claim 28, wherein the operation of selecting core node locations for the at least one service includes selecting core node locations for an aggregated plurality of services based upon a cost optimization of the aggregated plurality of services.

33. The machine-readable medium of claim 32, wherein the operation of determining the at least one optimized transport layer network design for the at least one service includes determining an optimized converged optical network transport

layer design for the aggregated plurality of services based upon routed transport demands.

34. The machine-readable medium of claim 32, wherein the operation of determining an optimized access layer network design for the at least one service includes determining an optimized access layer network design for the aggregated plurality of services by determining an optimal number of access devices and an optimal sizing of the access devices for each service of the aggregated plurality of services.